

## CHAPTER 1 INTRODUCTION

**Study Purpose.** The purpose of the San Antonio Channel Improvement Project (SACIP) General Reevaluation Report (GRR) is to document the investigations, studies, and analyses into the feasibility of implementing the remaining segment of the authorized flood damage reduction project (Park Reach), as well as adding ecosystem restoration to the completed project (Park and Mission Reaches). The GRR describes the characteristics of the existing- and future-without project conditions, water and related land resource problems and opportunities, planning objectives and constraints, evaluation of measures and alternatives, the methodology of analyses, the identification of the Federal project, and the recommended plan.

**Project Authority.** The SACIP was originally authorized under the authority of section 203 of the Flood Control Act of 1954 as part of a comprehensive plan for flood protection on the Guadalupe and San Antonio Rivers, which reads as follows:

**SEC. 203. SAN ANTONIO CHANNEL, SAN ANTONIO, TEXAS.**

*“The project for flood protection on the Guadalupe and San Antonio River, Texas, is hereby authorized substantially in accordance with the recommendations of the Chief of Engineers in House Document Numbered 344, Eighty-Third Congress at an estimated cost of \$20,254,000.”*

The project was subsequently modified in section 103 of the Water Resources Development Act of 1976, which reads as follows:

**SEC. 103. SAN ANTONIO CHANNEL, SAN ANTONIO, TEXAS.**

*“The flood control project for San Antonio Channel Improvement, Texas, authorized by section 203 of the Flood Control Act of 1954 (68 Stat. 1260) as part of the comprehensive plans for flood protection on the Guadalupe and San Antonio Rivers, Texas, is hereby modified to authorize and direct the Secretary of the Army, acting through the Chief of Engineers, to construct such additional flood control measures as are needed to preserve and protect the Espada Acequia Aqueduct, located in the vicinity of Six Mile Creek, at an estimated cost of \$2,050,000. Construction of such flood control measures shall be subject to the same conditions of local cooperation as required for the existing flood control project.”*

The project was subsequently modified, a third time, in section 335 of the Water Resources Development Act of 2000, which reads as follows:

**SEC. 335. SAN ANTONIO CHANNEL, SAN ANTONIO, TEXAS.**

*“The project for flood control, San Antonio channel, Texas, authorized by section 203 of the Flood Control Act of 1954 (68 Stat. 1259) as part of the comprehensive plan for flood protection on the Guadalupe and San Antonio Rivers in Texas, and modified by section 103 of the Water Resources Development Act of 1976 (90 Stat. 2921), is further modified to include environmental restoration and recreation as project purposes.”*

**Study Participants.** The SACIP-GRR, was initiated at the request of the San Antonio River Authority (SARA). A cost sharing agreement for the study was executed in November 2001. In addition to the Fort Worth District Corps of Engineers (USACE) and SARA, the study has been a multi-disciplinary effort among a wide range of participants including Bexar County, City of San Antonio, San Antonio River Oversight Committee, United States Fish and Wildlife Service (USFWS), United States Army Engineer Research and Development Center (ERDC), Texas Parks and Wildlife Department (TPWD), Texas Commission on Environmental Quality (TCEQ), as well as other resource agencies. The study area included lands within the National Park Service (NPS), San Antonio Missions National Historical Park boundary. Because of potential impacts to these lands, the NPS has participated in all aspects of the planning process and has been consulted in the preparation of the GRR as a cooperating agency. In addition, a number of architect-engineer consultants, academia, and other public and private organizations were involved in the study.

**Study Conduct and Process.** This study is being conducted in accordance with all applicable Federal and state laws, Executive Orders, as well as Corps of Engineers policies, regulations, and guidelines governing the development and implementation of water resources projects. During the conduct of the study, Fort Worth District has or will provide documentation to Headquarters, United States Army Corps of Engineers and Southwestern Division, United States Army Corps of Engineers for the purpose of gaining concurrence on the methodology and direction of the study as well as identifying and resolving any policy issues.

In accordance with the Engineer Regulation (ER) 1105-2-100 (Planning Guidance Notebook), the National Environmental Policy Act of 1969, as amended (NEPA), ER 200-2-2 (Procedures for Implementing NEPA), and the Council on Environmental Quality (CEQ) implementing regulations (40 Code of Federal Regulation (CFR) 1500-1508), consultations were with resource agencies regarding the protection of sensitive biological and cultural resources. Public involvement has occurred through San Antonio River Oversight Committee meetings (October 2000 and August 2002) and two public meetings for the Park (Museum) Reach (June 2002 and December 2002). Additionally, the draft GRR was released for public review and comment.

**Prior Studies and Reports on the SACIP.** The following is a summary of the Corps and local studies and reports conducted for the SACIP.

***Report of Survey of Guadalupe and San Antonio Rivers and Tributaries, Texas, for Flood Control and Allied Purposes (October 1950).*** This study by the USACE used data on major flooding events to establish flood estimates within the basin, analyzed the viability of providing flood control, and considered potential flood control measures.

***Guadalupe and San Antonio Rivers, Texas - Chief of Engineers Report (February 1954).*** This Corps of Engineers report served as the decision document for the authorized project (House Document Numbered 344, Eighty-Third Congress, 2d Session). The report concluded, in part, “that a serious flood problem exists within the city of San Antonio, an important military center and distribution point for a vast area in

southwest Texas, and that a flood-protection project for this city to eliminate the flood menace is economically justified.” Further, the report recommended “that a channel improvement project in San Antonio, Texas, be authorized at this time for construction by the Federal Government, substantially as outlined in this report, at an estimated first cost to the United States of \$12,906,900, provided that the local interests shall furnish assurances satisfactory to the Secretary of the Army . . .”

***San Antonio River and Tributaries, Texas, San Antonio Channel Improvement, Design Memoranda 1-8 (1955-1985).*** The purpose of the Design Memoranda (DM’s) was to present design and cost data serving the basis for preparation of the contract plans and specifications for construction of the proposed improvements of the San Antonio River Channel Improvement Project. The DM’s also served to document revisions to the authorized plan based on additional detailed engineering, economic, and environmental investigations and analyses.

***Environmental Impact Statement for the SACIP.*** 1971. This National Environmental Policy Act documentation prepared by USACE addressed the overall impacts of clearing, widening, deepening, and straightening the river channel and its tributaries. The document states “along the San Antonio mainstream, natural beauty will be given up for flood protection benefits.” It concluded that the SACIP would make the river and its tributaries cleaner and safer, and that adverse environmental effects would consist of minor tree and rock outcrop removal.

***Environmental Resource Evaluation of Unit 7 of San Pedro Creek and 8-3 Units of the SACIP.*** 1979. This USACE document provided existing baseline data that was incorporated into later National Environmental Policy Act documentation. The report characterizes San Pedro Creek and the San Antonio River as being highly impacted by urbanization. However, the document states that remnants of bottomland forest existed along the San Antonio River with native vegetation consisting of live oak, pecan, sycamore, American elm, mesquite and Arizona ash. Also noted were pool and riffle habitats within the San Antonio River.

***Supplement to the Final Environmental Impact Statement for the SACIP.*** 1981. This National Environmental Policy Act documentation, prepared by USACE, provided environmental analysis of three alternatives to the flooding problem in Unit 8-3-2 of the SACIP. Three alternatives were assessed; Without Project (No Action), Nonstructural (evacuation), and Structural (channel modification). The document clearly states that implementation of the recommended plan (channel modification) meant “destroying the aquatic and riparian habitat”, and that “productivity of the river would be diminished.”

***Water Quality Assessment of the San Antonio River Tunnel.*** 1994. This study modeled the potential for water quality impacts to the San Antonio River from discharges of the San Antonio River Tunnel (SART). It was undertaken at the request of SARA out of a concern that the lack of aeration facilities in the tunnel (under construction at the time) would, during storm events, significantly degrade water quality downstream of the SART outlet. The study concluded that water quality standards for the segment would not

ordinarily be violated from tunnel discharges since there would be adequate amounts of channel flow and local runoff to dilute any poor quality water being discharged from the SART outlet. However, the study also concluded a low probability existed that a fish kill would occur under worst-case conditions (tunnel discharge without local runoff).

***Water Quality Reassessment of the San Antonio River Tunnel.*** 2000. The water quality issue for the SART was revisited based on the probability of a storm occurrence in which an isolated storm, up stream of the SART inlet, would cause a discharge of poor quality tunnel water into the San Antonio River at a time when no storm flow in the channel or local runoff would be present. Using the QUALTX model, the study concluded that under these conditions water quality standards would not have been violated, but water quality in the river would decline (during the discharge event) in the reach just downstream of the SART outlet. A field verification of the model revealed that air entrainment from the cascade of water out of the SART outlet prevented any violation of water quality standards for the segment.

***San Antonio Channel Improvements Project Concept Design/Design Guidelines (July 2001).*** In 1998, Bexar County, the city and San Antonio, and the San Antonio River Authority formed the San Antonio River Oversight Committee (SAROC). The SAROC is comprised of a diverse group of citizens whose objective is the restoration and preservation of the San Antonio River. The design vision is to restore the San Antonio River to a more natural condition, while maintaining the existing flood damage reduction capability. In July 2001, the document “San Antonio River Improvements Project Concept Design, Design Guidelines was completed by the SWA Group for the SAROC. The purpose of the design guidelines was to establish the major framework in which future designs will be undertaken. The guiding design principals are broken down into three major components; hydrology, nature, and people.

#### *Hydrology*

- Design solutions will utilize the natural principals of fluvial geomorphology whenever possible, especially associated with the pilot channel.
- Design solutions will not increase flooding potential and all design solutions will attempt to reduce flooding potential.
- Design solutions will not increase river maintenance and will attempt to reduce maintenance requirements
- No design solution will reduce water quality, and all solutions will attempt to enhance water quality.
- Adequate base flow will be maintained along with the impounding of water.
- Recycled water will take precedence over the pumping of the aquifer water.
- Public land acquisitions will occur, as possible, to provide greater flood control and river flood carrying capacity.

#### *Nature*

- River channel solutions with a more natural appearance will take precedence over ‘architectural’ solutions whenever possible and will have sinuous edges to minimize the artificial channel appearance.

- Design solutions will utilize a variety of low flow conditions such as riffle/pools to increase habitat diversity and maximize fish and wildlife habitat value.
- Fish and wildlife habitats are desired and will be balanced with other needs of the river.
- Planting solutions will emphasize native and/or naturalized species and will reduce long-term mowing requirements to the extent possible.
- Tree plantings will be maximized, as possible, and coordinated with the appropriate river hydraulic capacity, to provide a variety of scales of spaces and ecotones, from dense coppices to open areas.

#### *People*

- Design solutions will be responsive to the specific context and will never be “typical”, providing a variety of experiences for different uses.
- Design solutions will enhance the appreciation of the river’s historic significance in the life and development of San Antonio.
- Pathways will be continuous along the river, along both sides as appropriate, and will interface with other systems as possible, such as Mission Trails.
- Future land use along the river will reinforce a sense of community and respect the human scale, provide variety and focus intense use in nodes, and encourage the economic viability of the area.
- Passive recreation uses will take precedence over active recreational.
- Design solutions will not increase current trash accumulation, graffiti, and other maintenance problems and will attempt to reduce long-term maintenance requirements.

**Corps of Engineers Projects and Ongoing Studies.** Numerous studies have been conducted regarding water resource development within the San Antonio River basin. The following summarizes those relevant studies and projects to this GRR, particularly as they relate to potential cumulative environmental impacts of all possible USACE water resource projects in the San Antonio River basin within the foreseeable future.

***Eagleland Habitat Restoration, San Antonio, Texas - Section 1135 of the Water Resources Development Act of 1986, as amended.*** The Eagleland Habitat Restoration Project is located within San Antonio, Texas along the channelized portion of the San Antonio Channel Improvement Project from the Alamo Street Dam downstream to Lone Star Boulevard Bridge at the San Antonio River Tunnel Outlet. Clearing of the floodway and channel realignment destroyed the vast majority of the high quality riparian habitat. The project will restore a three-quarter mile section of the San Antonio River, and will relocate the existing base flow channel to meander primarily along the outside of existing bends. The inside slopes will be lowered and softened where adequate area is available within the larger flood control channel. Native species of grasses and trees will be planted along the channel side slopes, the top of bank, and within the flood control channel to the extent practicable. As flood capacity permits, trees will be brought down toward the river’s edge along the outside meander bends to enhance riparian habitat development. A rock riffle structure will be constructed in the base flow channel to create a riffle-pool complex. In addition, tributary and stormwater outfall structures and

weirs will be ‘naturalized’ through the use of native stone and wetland plantings. The project has an estimated total project cost of about \$1.8 million. A construction contract was awarded in September 2003, and construction initiated in January 2004.

***San Antonio Channel Improvement Project, PL 84-99 Project Information Report (February 2003).*** During late June and early July 2003, the watersheds of the headwater tributaries of the San Antonio River, including Olmos Creek and San Pedro Creek, were at the epicenter of severe thunderstorms. The San Antonio River Authority (SARA) requested assistance repairing four sites within the San Antonio Channel Improvement Project, and an additional 26 sites on behalf of the City of San Antonio, damaged by erosion and bank failure. Three of the four sites (SARA) and six of the 26 (city of San Antonio) fall within the Mission Reach for the ongoing GRR, and therefore were not included in the report and repair recommendation. The damaged areas are located along Alazan, Martinez, Apache, and San Pedro Creeks, and the San Antonio River. Rebuilding the channel slopes with compacted fill and reestablishing turf was selected as the recommended plan. The total annual benefits for the entire project are estimated at \$7,100,000. The first cost to repair all the sites was estimated at \$2,203,500, having a total annual cost of \$190,200. The benefit-cost ratios of the tributaries and river range from 15.0 to 114.0, hence all are economically justified. The report recommended the repairs be approved for implementation. The initiation of construction is expected in February 2004.

***Olmos Creek Aquatic Restoration, San Antonio, Texas – Section 206 of the Water Resources Development Act of 1986, as amended.*** Olmos Creek, an ephemeral stream, is located near the central portion of Bexar County, Texas, approximately 5 miles north of the City of San Antonio central business district. Over the years, encroaching development has altered the surrounding riparian habitat, and altered the natural hydro-period of Olmos Creek. The resultant ecosystem degradation include lack of native vegetation, erosion, lack of stream shading, and substantial amount of invasive, non-native plant species. In addition, the riparian corridor is severely fragmented. Opportunities exist to create a continuous riparian corridor along Olmos Creek and reduce the erosion being experienced in certain portions of the creek. The riparian corridor will require the removal of the non-native/invasive species and the re-establishment of the native vegetation. An Environmental Assessment (EA) is currently being prepared describing the recommended plan, and its impacts. The final EA is to be completed in July 2004, and construction initiated in June 2005.

***San Antonio River, Federal Emergency Management Agency, Limited Map Maintenance Program.*** The work involves hydrologic and hydraulic analysis of the San Antonio River, from approximately 4000 feet upstream of Hildebrand Avenue to downstream of IH 410, and San Pedro Creek from the upstream end at Myrtle Street downstream to it’s confluence with the San Antonio River. The analysis incorporates the San Antonio River Tunnel and the San Pedro Creek Tunnel projects. Digital mapping for the 100-year and 500-year floodplain boundaries will be developed and incorporated as Flood Insurance Rate Maps. A Technical Notebook, documenting the technical aspects of the analysis will also be completed. The analyses began in February 2001, and are a

joint effort between the Fort Worth District, the city of San Antonio, the San Antonio River Authority, and their contractors. The anticipated completion date is February 2004.

***Guadalupe and San Antonio River Basins, Cibolo Creek Interim Feasibility Study.*** Alternating cycles of drought and flooding combined with population growth within the Guadalupe and San Antonio River basin have resulted in loss of life, extensive property damage, and severely degraded ecosystems. Recent flood events within the region accounted for at least 31 deaths, and caused damages estimated to be \$300 million. Land use changes, drought and urbanization has impaired surface and ground water resulting in degraded ecosystems. Preliminary data show high potential for restoration of ecosystems dependent on the Edward's Aquifer and significant flood damage reduction potential along the Cibolo Creek in the communities of Shertz and Selma. A feasibility study was initiated in 2002; the completion date has not been determined.

***Guadalupe and San Antonio River Basins, Salado Creek Interim Feasibility Study, and Leon Creek Interim Feasibility Study.*** During a flooding event in 1998, an estimated 17 inches of rainfall was recorded within a 30 hour period. The devastation from that flood event resulted in 25 deaths, and 1,150 homes or businesses damaged or destroyed in the city of San Antonio, with significant damage occurring along the Leon Creek Watershed. Flood damages were estimated at \$500 million in the city of San Antonio and the surrounding county area. During a July 2002 flood event, the San Antonio region received an estimated 16 inches of rainfall in six days resulting in 8 deaths, 280 homes damaged, and \$8.9 million in estimated infrastructure damage. The study is part of a feasibility study of the Guadalupe and San Antonio River Basins. Urban growth within the watershed has resulted in environmental degradation and increased flooding frequency. The study will investigate the Leon Creek Watershed to address improvements in the interest of flood damage reduction, ecosystem restoration, water quality, water supply, recreation and other allied purposes. The studies are scheduled to begin in 2005; the completion dates have not been determined.

***Guadalupe and San Antonio River Basins, Lower San Antonio River Basin Interim Feasibility Study.*** Flooding within various portions of the Guadalupe and San Antonio River basins was severe in 1972 and in 1978, when portions of them were declared disaster areas. Flooding again plagued the area in 1997, with total damages estimated at \$1.9 million. In October 1998 a large flood event accounted for at least 31 deaths, and caused damages estimated to be \$300 million. Many communities experienced inundation to rooftop levels, with water velocities great enough to completely demolish brick homes. The most recent flood event, in June-July 2002, resulted in 9 deaths in the study area. The study consists of an investigation of the Guadalupe and San Antonio River Basins to address improvements in the interest of flood damage reduction, environmental restoration, water quality, water supply, recreation and other allied purposes. Both structural and nonstructural solutions will be investigated to reduce flood damages while addressing the environmental needs of the watershed. Initial studies have identified potential water resource opportunities in the *Cibolo*, *Leon*, and *Salado* watersheds and the region encompassed by the Goliad, Karnes, and Wilson Counties

(Lower San Antonio River Basin). The overall feasibility study completion date is to be determined.

***San Antonio Channel Improvement Project, Alamo Heights, Reconnaissance Study, and Woodlawn, Reconnaissance Study.*** During a July 2002 flood event, the San Antonio region received an estimated 16 inches of rainfall in six days resulting in 8 deaths, 280 homes damaged, and \$8.9 million in estimated infrastructure damage. Reconnaissance studies are currently being performed for the Alamo Heights and Woodlawn Lake areas of San Antonio to determine if there is a Federal interest in proceeding with a cost-shared General Reevaluation Report.

**San Antonio River Channel Improvement Project (SACIP).** Construction of the authorized flood damage reduction project was initiated in October 1957, and essentially completed in April 1998. The total length of the constructed project is approximately 34.9 miles, including 14.4 miles on the San Antonio River, 5.0 miles on San Pedro Creek, 4.0 miles on Apache Creek, 4.3 miles on Alazan Creek, 6.7 miles on Martinez Creek, and 0.5 miles on Six Mile Creek. Two flood diversion tunnels, each approximately 24 feet in diameter, were constructed beneath the downtown area; the first on the San Antonio River is approximately 3.1 miles long, and the second on San Pedro Creek, is about 1.1 miles in length. The authorized project cost was \$20,254,000; the current project cost is \$230,000,000. Figure 1-1 displays the location of the SACIP.

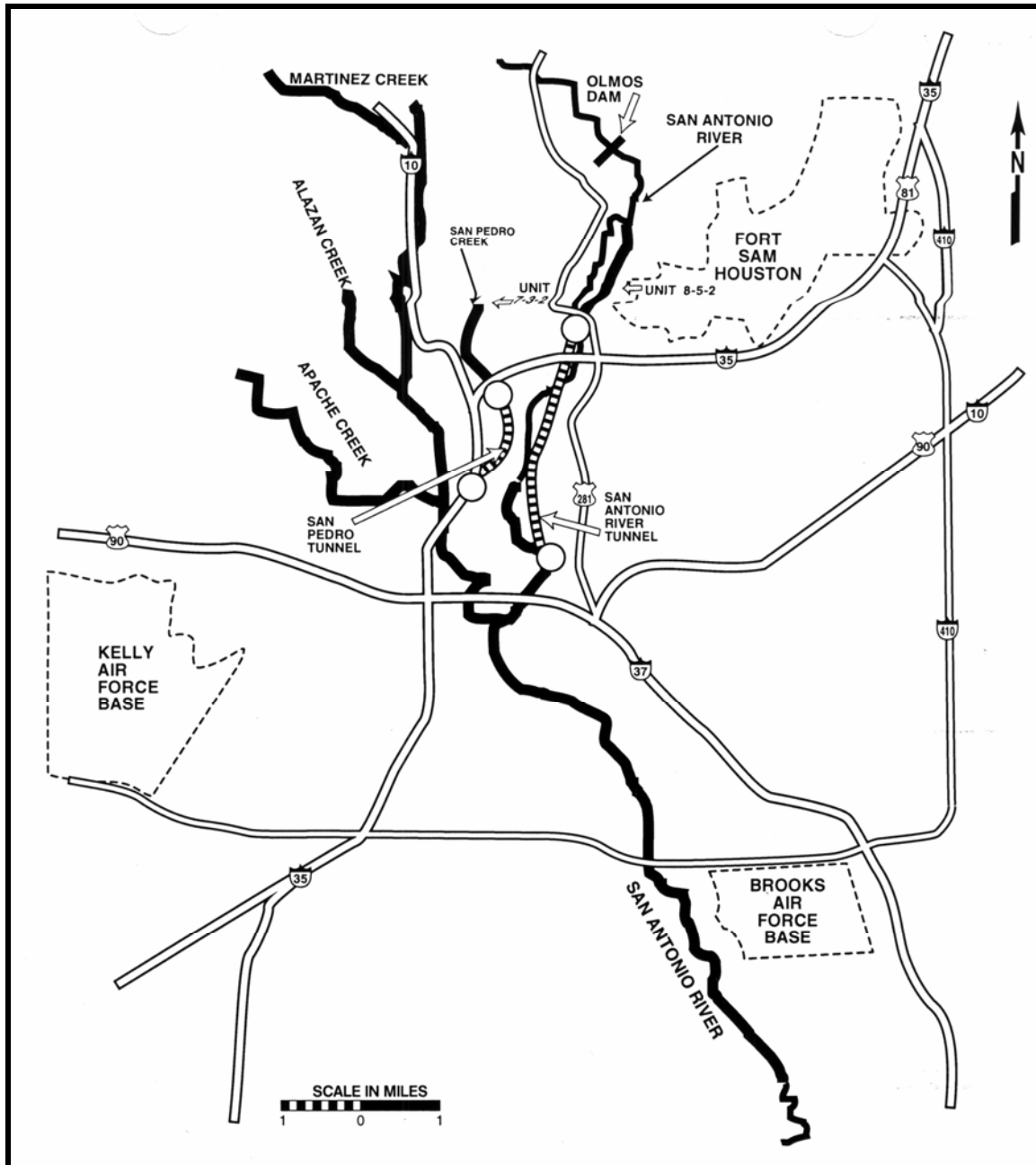
The portion of the SACIP downstream of the tunnel outlet (Mission Reach) was designed and constructed as a grass-lined trapezoidal channel, having bottom widths varying from 50 feet to 300 feet and 2.5 horizontal to 1 vertical (2.5H:1V) side slopes. A pilot channel was constructed in the downstream of San Pedro Creek, generally to a depth of 2.5 feet below the floodway channel centerline, with 2H:1V side slopes. The original project design discharge was based on the transposed storm of 26-27 September 1946. This storm was estimated to be the storm of record at the time the project was designed. A large storm occurred in September of 1921 and produced higher recorded discharges but occurred prior to the construction of Olmos Dam. The original project design discharges were 16,400 cubic feet per second (cfs) above the San Pedro Creek confluence, 70,300 cfs below the confluence, and 85,700 cfs below Berg's Mill (Ashley Road). By comparison the current 100-year discharge computed for the LMMP is about the same below San Pedro Creek and is less than 10% higher below Ashley Road. The 100-year flood is defined as the magnitude of flood having a 1 percent chance of being exceeded in any year.

There are a number of structures lying within, or spanning the San Antonio River. They include eleven bridges, two low water crossings, two dams, eleven grade control structures, over 100 stormwater and tributary outfalls, structure remnants, and utilities. Table 1-1 displays a list of the prominent features within the San Antonio River below the tunnel outlet.

The San Antonio River Authority (SARA) is responsible for operation and maintenance of the San Antonio Channel Improvement Project. Maintenance of the San Antonio River channel includes regular mowing and the removal of undesirable woody growth within the floodway, maintaining channel cross-section dimensions by removing excessive sediment,



**Figure 1-1**  
**Location of the San Antonio Channel Improvement Project**



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**Table 1-1**  
**List of Prominent Features on San Antonio River below the Tunnel Outlet**

<b>River Station</b>	<b>Feature Description</b>	<b>River Station</b>	<b>Feature Description</b>
2121+24	Lone Star Blvd Bridge	1809+25	Begin concrete pilot channel
2116+28	Check dam #10	2047+35	Large storm outfall
2113+10	Check dam #9	2007+68	Concrete grade structure
2104+28	Check dam #8	2006+30	Mission Road bridge
2104+00	Large storm outfall	1993+00	Large storm outfall
2098+97	Southern Pacific RR Bridge	1978+30	Storm outfalls
2098+67	Storm water outfall	1944+07	White Avenue bridge
2098+67	Check dam #7	1963+00	Southcross Avenue bridge
2095+10	Steves Avenue	1937+00	Large storm outfall
2090+00	I.H. 10 bridge	1910+45	San Juan diversion structure
2092+10	Check dam #6		San Juan acequia inlet structure
2087+30	Check dam #5	1899+52	Old San Juan Dam
2082+45	Check dam #4	1877+66	Confluence w/ Asylum Creek
2082+25	Large storm outfall	1850+00	Espada Dam
2075+80	Check dam #3	1847+05	LWC below Espada Dam
2071+82	Check dam #2	1846+00	Old river channel return flow
2068+10	Check dam #1	1809+40	Ashley Road bridge
2061+53	Stepped drop structure	1809+25	Begin concrete pilot channel
2060+50	San Pedro Creek	1802+00	Diversion structure
2051+00	East Theo Road bridge	1937+00	Large storm outfall
2048+00	Historic channel to east	1910+45	San Juan diversion structure
2047+35	Large storm outfall		San Juan acequia inlet structure
2007+68	Concrete grade structure	1899+52	Old San Juan Dam
2006+30	Mission Road bridge	1877+66	Confluence w/ Asylum Creek
1993+00	Large storm outfall	1850+00	Espada Dam
1978+30	Storm outfalls	1847+05	LWC below Espada Dam
1944+07	White Avenue bridge	1846+00	Old river channel return flow
	Southcross Avenue bridge	1809+40	Ashley Road bridge
1937+00	Large storm outfall	1809+25	Begin concrete pilot channel
1910+45	San Juan diversion structure	1802+00	Diversion structure
	San Juan acequia inlet structure	1791+00	Six Mile Creek by-pass channel
1899+52	Old San Juan Dam	1774+28	Confluence with old river channel
1877+66	Confluence w/ Asylum Creek	1736+67	I.H. 410 bridge
1850+00	Espada Dam	1732+00	Diversion
1847+05	LWC below Espada Dam	1727+60	Camino Coahuilteca LWC
1846+00	Old river channel return flow	1726+00	Return flow from old river channel
1809+40	Ashley Road bridge	1698+70	Southern limit of Mission Reach; transition of channel bottom width from 300 ft to 50 ft

clearing silt and debris from drainage outfalls, and the repair of localized erosion. The majority of the maintenance is accomplished by the city of San Antonio, while the SARA maintains a small portion of the downstream end of the project.

The project is inspected annually and a report prepared by the Fort Worth District. A review of recent inspection reports indicates the project is in good condition. Mowing and the removal of undesirable woody vegetation appears to be occurring regularly, the channel cross sections are generally well defined, and the outfalls are in good condition with no adverse scour or adjacent erosion. Areas of localized erosion are repaired in a timely manner.

Of particular note, is sediment and gravel deposition in Davis Lake upstream of Espada Dam. Material has accumulated within the lake adversely affecting the capacity of the project as noted in the August 2003 inspection report. The city of San Antonio has completed the removal of approximately 169,000 cubic yards of material in this area in 2003. Other areas where sediment and gravel are routinely removed include a concrete approach channel upstream of Ashley Road, and the channel upstream of Camino Coahuilteca.